

♂ .88, ♀ .98; length of forceps, ♂ 1.9, ♀ 2.24; greatest (proximal) width of arm of forceps, ♂ .79, ♀ .85 mm.

General coloration shining, blackish with an auburn tinge. Antennae auburn, the proximal joints very slightly paler. Limbs warm buff, marked as described in key.

In addition to the type and allotype, a pair bearing the same data, in the Hebard Collection, and a female, from the same locality, taken in the spring of 1904, by W. M. Wheeler, in the Academy of Natural Sciences Collection, are designated paratypes.

The following previously unrecorded material is before us:

Cape Haitien, Hayti, (W. M. Mann), 1 ♀, [Mus. Comp. Zool.].

Momance, Hayti, XI, 1912, (W. M. Mann), 1 ♀, [Hebard Coll.].

St. Marc, Hayti, I, 1913, (W. M. Mann), 1 ♂, [Mus. Comp. Zool.].

Arecibo, Arecibo, Porto Rico, VII, 30 to VIII, 1, 1914, (Lutz, Mutchler, Watson; under bark of rotten stump and under logs), 1 ♂, 1 ♀, [Acad. Nat. Sci. Phila.].

Utuaado, Arecibo, Porto Rico, (W. M. Wheeler), 1 ♂, 3 ♀, [Amer. Mus. Nat. Hist.].

Baños de Coamo, Ponce, Porto Rico, (W. M. Wheeler), 1 ♂, 2 ♀, 3 juv., [Amer. Mus. Nat. Hist.].

Aibonito, Ponce, Porto Rico, VI, 1 to VII, 17, 1914 and 1915, (Lutz, Mutchler, Barber; in rotten logs), 1 ♂, 2 ♀, [Amer. Mus. Nat. Hist.].

Port of Spain, Trinidad, III, 4, 1910, 1 ♂, [Acad. Nat. Sci. Phila.]

The last is the southernmost locality known for the species.

### **Euborellia janeirensis** (Dohrn)

1864. *F[orcinella] janeirensis* Dohrn, *Stettin Ent. Zeit.*, xxv, p. 285. [?]  
Rio de Janeiro, Brazil.]

Two males and three females from Ceará Mirim, Rio Grande do Norte and Independencia, Parahyba, Brazil, correctly recorded as this species by Rehn,<sup>8</sup> have been used as the basis for the comparisons made in the present paper.

<sup>8</sup> Trans. Am. Ent. Soc., XLII, p. 218, (1916).

## EXPLANATION OF PLATES

## Plate XVIII

Mangrove swamp on edge of Brickell's Hammock, Miami, Florida. Habitat of *Euborellia ambigua*, *Hygronemobius alleni*, *Anaxipha scia* and other species.

Fig. 1.—Looking into swamp from seaward border. Tidal litter shown in foreground, beneath which *Euborellia ambigua* occurred.

Fig. 2.—Seaward border of swamp, looking out toward Biscayne Bay from the same spot shown in figure 1. The mangrove shoots shown in the lower right-hand corner were the preferred habitat of *Anaxipha scia*, while beneath the tidal litter at their bases *Euborellia ambigua* was found.

## Plate XIX

Fig. 1.—*Euborellia ambigua* (Borelli). Brickell's Hammock, Miami Florida. Dorsal outline of male. ( $\times 3$ )

Fig. 2.—*Euborellia ambigua* (Borelli). Brickell's Hammock, Miami, Florida. Lateral view of distal portion of male abdomen. ( $\times 4$ )

Fig. 3.—*Euborellia ambigua* (Borelli). Brickell's Hammock, Miami, Florida. Dorsal view of distal portion of female abdomen. ( $\times 4$ )

Fig. 4.—*Euborellia caraibea* new species. Nassau, New Providence Island, Bahamas. Type. Dorsal outline of male. ( $\times 3$ )

Fig. 5.—*Euborellia caraibea* new species. Nassau, New Providence Island, Bahamas. Type. Lateral view of distal portion of male abdomen. ( $\times 4$ )

Fig. 6.—*Euborellia caraibea* new species. Nassau, New Providence Island, Bahamas. Allotype. Dorsal view of distal portion of female abdomen. ( $\times 4$ )

STUDIES IN AMERICAN EPHYDRIDAE  
(DIPTERA)

BY E. T. CRESSON, JR.

III. A REVISION OF THE SPECIES OF GYMNOPA  
AND ALLIED GENERA CONSTITUTING THE  
SUBFAMILY GYMNOPINAE.

The species treated in this paper belong to a subfamily which I propose for the reception of *Placopsidella*, *Gymnopa*, *Athyroglossa*, *Ochtheroidea*, and *Ceromctopon*. In my classification of the Ephydridae, this group of genera comes first in the linear arrangement. It is questionable, however, whether these genera are members of the Ephydridae. They strongly suggest in many respects relationship to members of the Oscinidae or the Agromyzidae, and this unconformity is largely responsible for placing the group far from *Ephydra* and its allies.

In criticism of the Haliday-Loew classification followed by Becker et al., I have to say that *Athyroglossa* and *Ochtheroidea* are certainly related to *Gymnopa*, not with *Hydrina* or *Ochthera*. Superficially the species of *Ochtheroidea* resemble those of *Hydrina*, but there is no logical similarity to those of *Ochthera*, except in the slightly thickened, spinose fore femora. This thickening is also present in some species of *Discocerina*, which genus belongs to a distinct group. The genus *Placopsidella* is very closely related to *Gymnopa*, and contains, from present knowledge, a single oriental species, *cynocephala* Kertész.

In this subfamily I would also place the genus *Heccamede*. Its position, however, is difficult to determine. But one, a European, species is known.

As stated in the introductory remarks to these studies given in the first paper, I intend to publish a revised classification of the family at the end of the series. These studies of an apparently large, little known family of Diptera, being necessarily preliminary in nature, I will abridge the diagnoses to what seem to be essential characteristics, leaving the more exhaustive descriptions to the monographer.

The material upon which these studies are based is listed in the introduction to my first paper.<sup>1</sup> Since then additional material has been received from the following sources: California Academy of Sciences, [Cal. Ac. Sc.]; Museum of Comparative Zoology, [M. C. Z.]; New York Academy of Sciences, Porto Rico Survey, through Dr. Frank E. Lutz, [N. Y. Ac. Sc.]; United States Department of Agriculture, Biological Survey, [Biol. Surv.]. To these also I extend thanks for the privilege of studying their collections. In cases where no source is given, it is understood that the material is from the collections at the Academy of Natural Sciences of Philadelphia.

#### Subfamily GYMNOPIINAE

It is certainly advisable to consider the genera here included as representing a distinct subfamily, if they are to be admitted into the Ephydridae. They do not seem to intergrade with any other group, being at once recognizable by the sharp, post-buccal ridge. This ridge is the vertical keel or emargination separating the post-buccal area from the occiput, and extends from the oral margin to near the post-orbits, vanishing there at about on the center line of the eyes. The known species have the following additional characters, which may be considered of subfamily value.

Head subhemispherical; occiput entirely concaved. Eyes round or slightly oblique, bare; post-orbits visible in profile. Frons convex in profile, the areas weakly defined; orbits parallel, with the usual vertical bristles; ocelli close, not tuberculate, with post-ocelli removed from the vertex; orbital bristles proclinate when present; no reclinate frontals. Face deeply excavated beneath antennae for its entire width; lower portion, in profile, prominent, convex or tuberculate medianly; parafacialia dilating below into the broad cheeks; the groove distinct; facialia sometimes broad and sculptured, bearing three or more appressed medianly inclined bristles. Cheeks with well developed post-buccal area, but no bristle. Clypeus strongly

<sup>1</sup> Trans. Amer. Ent. Soc., XLII, 101, 1916.

developed, apron-like, projecting and occupying the narrow, emarginated epistoma. Proboscis retractile. Antennae short; second joint with short apical spine. Thorax quadrate, with fore coxae not attaining base of middle ones. Mesonotum rather convex; setulae numerous and irregular, or sparse and serially arranged; one post-dorso-central near base of scutellum, one post-alar, two notopleurals, one or more marginal mesopleurals, one sternopleural. Scutellum broad, with four bristles. Abdomen ovate. Legs rather slender, but fore femora thickened, generally with a post-flexor series of short spines, several of which are sometimes stronger than the others. Wings elongate; costa broad at humeral cross-vein; no cleft at first vein; auxillary vein ending in first near middle of latter; second vein long and straight; third and fourth veins generally parallel. All bristles proportionately short.

There are six genera known to me, four of which, embraced in the scope of this paper, may be separated as follows:

#### *Table of Genera*

Alula broad, auriculate (Gymnopini).

Face with a median shining tubercle; frontal bristles very weak **Gymnopa**

Face medianly wrinkled without tubercle; fronto-orbital bristles well developed **Cerometopon**

Alula narrow, linear **Athyroglossa, Ochtheroidea**

#### **GYMNOPA** Fallen

1820 *Gymnopa* Fallen, Dipt. Suec., Oscin., 10.

1856. *Glabrinus* Rondani, Prod. Ital., 1, 132.

This genus I have considered typical of the present subfamily. Its species are similar to those of *Discocerina* superficially. Both genera are probably old, branching early in their phylogeny. The present genus has been placed in various families by previous authors, showing that they suspected its lack of affinity with recognized Ephydrid groups. By most authors, however, it was considered a Chloropid rather than an Ephydrid. It is probably neither, but is included with its allies in the present paper on account of its apparent relationship with the other members of the Ephydridae.

This genus, as based on its genotype, is fairly well characterized by the weak or undeveloped macrochaetae, the frontals and fronto-orbitals being scarcely discernible even the ocellars and the verticals are very weak. The face is medianly wrinkled or papillose, with a well marked rounded shining tubercle. The arista is bare or pubescent, and the mesonotum and scutellum finely scabrous or granulose, giving them a subopaque appearance; the setulae are numerous and irregular. The alula of the wings is strongly auriculate. Regarding the facial structure and the sculpturing of the mesonotum and scutellum, there are some species of *Athyroglossa* possessing these characteristics, and one or two show considerable recession in the development of the frontal bristles and arisal pectination. Therefore one must be careful in working with such species. A character which seems to be valuable in separating these genera is the development of the alula. This portion of the wing in *Athyroglossa* is very narrow, sometimes scarcely discernible, while in *Gymnopa* it is very broadly lobed.

*Genotype*.—*Gymnopa aenea* Fallen (1820)=*Syrphus subsultans* Fabricius (1794).

Walker described two species from the United States, which he credited to this genus, but I cannot secure trace of the types in the British Museum, and therefore cannot recognize them. His descriptions, however, apply more to some of the *Psilopini* than to this genus.

These Walkerian species are:

*Gymnopa nigroaenea* Walker, Dipt. Saund., 413, 1852.

*Gymnopa tarsalis* Walker, Dipt. Saund., 413, 1852.

*Synonymy*.—*Gymnopa* as a generic name was used in the present sense until 1864, when Schiner associated Latreille's name *Mosillus* with this group. Loew, in 1870<sup>2</sup>, protested against the use of *Mosillus* on the grounds of sixty years usage of *Gymnopa* and the doubtful meaning of *Mosillus*. Becker held the same opinion. Since 1864, the group has been called by either name, according to the view of the student. The name *Mosillus* first appeared in the literature in 1804, proposed by Latreille.<sup>3</sup> Two species are there cited with queries (*Musea*

<sup>2</sup> Jahrb. Gelehr. Ges. Krakau, xli, [sep. pagination] 15, 1870.

<sup>3</sup> Nov. Dict. Hist. Nat., xxiv, Tab. Meth. 196.

*demandata* and *M. frit* Fabricius) and a note made referring the genus, as he considered it, to his group "Sombres ou metal-liquies division des *M. vibrantes*." In referring to Latreille's earlier work<sup>4</sup>, under the division mentioned we find three species cited: *Musca vibrans*, *frit*?, and *subsultans*? Linnaeus. We must therefore consider *Musca vibrans* the genotype of *Mosillus* Latreille, 1804. This acceptance would exclude that genus from the Ephydriidae. Consideration of *Mosillus* as antedating *Gymnopa* may be allowed by dating the former from an 1805 reference,<sup>5</sup> where *Musca arcuatus* Latreille is the included species. Study of the descriptions of the 1804 and 1805 references shows that, although identical they are very different from that of his "Mouches vibrantes," and from the same division mentioned in the Dictionnaire.<sup>6</sup> The latter evidently refers to the flies allied to the present *Scioptera vibrans*. It will be seen from the above analysis that the name *Mosillus* had better be discarded, at least for this genus.

**Gymnopa tibialis** Cresson (Plate XX, figures 1, 4, and 5.)

1916. *Mosillus tibialis* Cresson, Ent. News, xxvii, 149.

This name was proposed for our American species, which differs in many respects from specimens of the European *sub-sultans* examined. Most noticeably is this so in having the frontal triangle densely granulose or scabrous near the ocelli, and the tibiae tawny, not black.

*Description*.—♂, ♀. Black; third antennal joint sometimes, tibiae except middle of hind pair, tarsi except apices, tawny. Halteres white. Wings hyaline with milky tinge; veins yellow.

Shining to polished with faint metallic reflections. Cheeks and abdomen smooth and polished. Frontal triangle setulose, densely and finely punctate, especially near the anterior ocellus; frontalia smooth and subopaque. Facial tubercle in profile, conical (fig. 1). Parafacialia, but not cheeks, foveae, the papillose facialia, and antennae somewhat, silvery. Mesonotum densely scabrous and sparingly light pruinose, which appears more dense as two anterior median vittae and irregular lateral areas. Scutellum scabrous and setulose, the margin with several stout, short bristles besides the usual four. Second abdominal segment the longest, with a depressed triangular area in the middle of the dorsum basally; fifth segment triangular, truncate, with a

<sup>4</sup> Hist. Nat. Crust. et Ins., iii, 458, 1802.

<sup>5</sup> Hist. Nat. Crust. et Ins., xiv, 389, 1805 (An. xiii)

<sup>6</sup> xv, 126, 1803.



densely scabrous, pilose, flattened, ovate area on dorsum near apex; the male with several rounded indentations laterally near base. Fore femora thickened, spinose beneath, with the proximal spine the longest (fig. 5). All tibiae silvery on outer surfaces. Length.—2.8 to 3.5 mm.

*Type*.—♂; Wildwood, New Jersey, July 18, 1908, (Cresson), [A. N. S. P. No. 6103].

The above description, in main part, gives only those characters by which this species differs from *subsultans*, as represented by three specimens from Europe, determined, and kindly sent to me, by Prof. Mario Bezzi, of Turin, Italy. I have received specimens from various collections labeled *Gymnopa nana* Walker and *Gymnopa aenea* Fallen. Fallen's name is considered synonymous with *subsultans*. *Ephydra* (*Gymnopa*) *nana* Walker, I do not know, but the description suggests this species. Mr. E. E. Austin of the British Museum, to whom I sent specimens for comparison with Walker's type, reported that the latter is not in the collection there. The sexes are difficult to distinguish. The indentures on the fifth abdominal segment of the male will help in most cases.

*Variation*.—The examination of a good series of this species shows comparatively little variation. There is some in the extent of the pollinose vesture, the amount of papillose sculpturing on the face, in the amount of milkiness of the wings, and in the color of the tibiae. The scabrous area at the apex of the abdomen is much less confined to the flattened ovate area, and the lateral indentations are usually wanting, in the specimens from Seattle, Washington, and Saltair, Utah. In these the face is nearly denuded of the silvery coating, and the tibiae are darker. Were it not for the sculptured frontal triangle, I would suspect the series to be a closely related form of *subsultans*. A good series of that species may show variations which will endanger the validity of the present one.

*Synonymy*.—*Gymnopa nigroaenea* and *tarsalis* of Walker are unrecognizable from the descriptions, but suggest *Psilopa* rather than *Gymnopa*. The types cannot be located in the British Museum.

*Material Examined*.—194 specimens.

CANADA: Nelson, British Columbia, July 17, [Wash.].

MASSACHUSETTS: Cohasset, September 8, (O. Bryant), [B. S. N. H.].



NEW YORK: Cold Spring Harbor, Long Island, July, [Wash.]. Oak Island, Long Island, July, [Wash.]. Sea Cliff, (N. Banks), [Banks].

NEW JERSEY: Riverton, September to October, (C. W. Johnson), [H. N. M.]. Cramer Hill, August 24, (C. W. Johnson), [Johnson]. Wildwood, July 18, (Cresson).

PENNSYLVANIA: Swarthmore, June 13, (Cresson).

MARYLAND: Chesapeake Beach, June to July, (R. S. Shannon). [U. S. N. M.]; September 18, (N. Banks; salt marsh), [Banks].

VIRGINIA: Falls Church, (N. Banks), [Banks]. Potomac Creek, May 22, (C. W. Johnson), [Johnson].

GEORGIA: Tybee Island, August, 26, [Cornell].

FLORIDA: Bradentown, March, (M. C. VanDuzee), [VanDuzee]. Punta Gorda, November 11, [A. M. N. H.].

TEXAS: El Paso, April 5, (Viereck and Rehn). Galveston, April to June, [Wash.].

WYOMING: Sheridan, July, (C. W. Metz), [Wash.].

UTAH: Saltair, July, (J. M. Aldrich).

ARIZONA: Bill Williams Fork, August, (F. H. Show), [Kans.]. Squaw Springs, July 24, [Wash.].

WASHINGTON: Almota, June 24; Dungeness, August 24; Glenwood, Klickitat River, June 27; Kamiac Butte; Kennewick, June 7; Olga, July 26; Quilecene, August 6; Yakima; (all A. L. Melander), [all Wash.].

CALIFORNIA: Anaheim, Orange County, September 23, [Cal. U.]. Berkeley Hills, April 20, (Cresson). Los Angeles County, March 21 to April 1, (M. C. VanDuzee), [VanDuzee]. Monterey County, July 23, [Wash.]. Olancha, June 5, (C. L. Fox), [Cal. Ac.]. Redlands, (F. R. Cole), [M. C. Z.]. Redondo, Los Angeles Co., May 23; Rivera, June 17; [all Wash.]. San Diego County, December 12 to May 8, (M. C. Van Duzee), [Van Duzee]. San Francisco, Golden Gate Park, August 7, to January 5, [Cal. U.].

YUCATAN: Progreso, December 11, [U. S. N. M.].

BERMUDA ISLANDS: July 20, (Trevor Kincaid), [Johnson].

### ATHYROGLOSSA Loew

1860. *Athyroglossa* Loew, Neue Beitr., vii, 12.

For sometime I was at loss for characters by which this genus could be definitely separated from *Gymnopa*. For there are quite a number of characters common to, or are similar in, both genera. It was difficult to decide what characters could reasonably be considered generic. The development of the bristles and arisal pectinations seem to be variable, as well as the arrangement of the mesonotal setulae. Finally a few characters were found which seem to hold, and clear up the situation considerably. The face in this genus is not so deeply excavated beneath the antennae and the lower portion is more

convex, without distinctly defined tubercles, with the sculpturing confined to the narrow facialia near the bristles; the alula are linear or very narrow, not auriculate.

On the other hand, the separation of *Ochtheroidea* is not so easily defined. In fact it is a question whether the two are distinct. However, the two species in our fauna have all the tibiae and their halteres black, and the arista short haired above. None of the known species of *Ochtheroidea* have this combination of characters.

*Generic Diagnosis*.— In general build similar to *Gymnopa*. Eyes slightly oblique elongate; vertex sharp and arcuate. Ocellars situated beyond line of anterior ocellus; proclinate orbital well developed; reclinate frontal distinct. Frons usually broader than long; lunule slightly depressed. Face with median area below subtuberculate to convex; facialia, generally, not defined mesally, with three or more appressed bristles or hairs emitted from minute pits close to the para-facial groove; para-facialia narrow above, the groove continuing to the post-buccal ridge. Arista short haired above. Fourth abdominal segment the longest; fifth short. Alula of wings narrow, not produced beyond the cleft, with long cilia.

*Genotype*.—*Notiphila glabra* Meigen (1830). [Monotypic.]

The two forms occurring within our fauna seem also to be European species, and may be distinguished as follows:

All tibiae entirely black.

Halters white . . . . . *Ochtheroidea centralis*

Halters black.

Mesonotal setulae irregular; scutellum scabrous, flattened . . . *glabra*

Mesonotal setulae seriated; scutellum smooth, convex . . . *ordinata*

Only fore tibiae entirely black (see *Ochtheroidea*).

***Athyroglossa glabra*** Meigen (Plate XX, figure 2.)

1830. *Notiphila glabra* Meigen, Syst. Besch., vi, 69.

1860. *Athyroglossa glabra* Loew, Neue Beitr., vii, 12.

In comparing our material with specimens of *glabra* from Europe, I find very little differentiation. There may be slightly more sculpturing and the females are always more shining than the males in our specimens. The species seem to be well distributed.

*Description*.—♂, ♀. Entirely shining black, with frons and mesonotum, especially of male, somewhat granulose and lightly brownish pruinose, appearing somewhat brassy. Halteres black. Wings hyaline. All tarsi, except apices, whitish yellow; face with upper concavity and orbits somewhat hoary.

Face with four bristles interspersed with fine hairs; lower median portion transversely, subconically convex (fig. 2), and rather irregularly rugulose. Cheeks about one-half height of head, noticeably descending at the post-buccal ridge. Antennae situated on line with center of eyes, slightly above that of head; third joint longer than second; arista with five to six moderately long hairs.

Mesonotal setulae scattered, not serially arranged, and are more numerous in male than in the female. Scutellum scabrous and setulose, only slightly convex in the female; apical bristles with minute tubercles at their bases. Fore femora with only faint indications of flexor spines. Length.—3 mm.

*Type*.—Described from specimens in the Winthem Collection, now at Vienna. Inhabiting Europe.

*Material Examined*.—8 ♂, 3 ♀.

NEW YORK: Beaverkill, Sullivan County, August 5-12, (Cresson). Ithaca, May 17, [Cornell].

IDAHO: Pottsville, August 23, (A. L. Melander), [Wash].

WASHINGTON: Alnota, June 24; Ripa, April 8, (all A. L. Melander), [all Wash.].

OREGON: Eagle Creek, Forest Reserve, July 1, (A. L. Melander), [Wash.].

CALIFORNIA: Lagunitas Canyon, Marin Co., March 29, (Cresson).

### ***Athyroglossa ordinata* Becker**

1896. *Athyroglossa ordinata* Becker, Berl. Ent. Zeit., xli, 135.

My material agrees so well with the description of this European species there is nothing more to do than consider the determination as correct, although not without reluctance. That it is congeneric with *glabra* may also be doubted, in that the mesonotal setulae are few and distinctly seriated, but this character shows the same variation in *Ochtheroidea*.

*Description*.—♂, ♀. Similar to *glabra*, but smaller, generally smoother and more polished, without any trace of pollinosity. Upper part of the face polished, and with only two bristles besides the smaller hairs in the same series. Oral margin not oblique in profile, but emarginated at the epistoma. Cheeks about one-fourth height of head, not descending at occiput. Antennae situated lower in relation to the eyes. Arista with five to six very short hairs.

Mesonotum polished, with few setulae arranged in six distinct median rows, becoming more scattered laterally. Scutellum more convex than in *glabra*, not at all scabrous, and without tubercles. Abdomen polished. Leg

shining black, with basal joints of fore tarsi yellow; no trace of femoral spines. Length.—1.4 to 2.4 mm.

*Type*.—♀; Orsova, Hungary, [Becker Collection].

*Material Examined*.—13 specimens.

NEW HAMPSHIRE: Cornish, July 13 (C. W. Johnson), [B. S. N. H.].

VERMONT: Lyden, June 13, [Wash.].

NEW YORK: Beavertkill, Sullivan County, August 6, (Cresson).

NEW JERSEY: Trenton, July 4, (H. S. Harbeck).

MARYLAND: Plummer's Island, April 12, (W. L. McAtee), [Biol. Surv.].

ILLINOIS: Algonquin, June 1, (W. A. Nason); Urbana, November 21, (on window), [all Illinois].

IDAHO: Moscow, (J. M. Aldrich), [Aldrich]. Potlatch; Priest Lake, August 1, (A. L. Melander); [all Wash.].

WASHINGTON: Glenwood, Klickitat River, June 27; Prosser, May 4; (all A. L. Melander). [all Wash.].

CALIFORNIA: Lagunitas Canyon, Marin Co., March 29, (Cresson). Palo Alto, September 4-5, (J. C. Bradley). [Cornell].

#### **OCHTHEROIDEA** Williston

1896. *Ochtheroidea* Williston, Trans. Ent. Soc., London, 1896, 401.

It is very doubtful if this genus is distinct from *Athyroglossa*. It was proposed for the reception of a species which does not show as much differentiation from the type of *Athyroglossa* as do some of the others, which if not included here will have to go under a new genus. This latter treatment is not advisable at present. Were there not an apparent intergradation between the serial and the non-serial arrangement of the mesonotal setulae, one might consider this characteristic of some generic importance. So it may prove to be, especially where in one type the setulae are arranged in well separated series, in contradistinction to the other in which the setulae are more numerous, and at most indistinctly arranged in very close series. However, there seems to be no other characteristics correlated with these two types, and such treatment would throw our *ordinata* out of *Athyroglossa*, probably make *Ochtheroidea* a synonym of *Athyroglossa*, and also make it necessary to erect a new genus for the reception of the first mentioned type of species.

However, after much study of the material before me, containing relative good series from many localities, including the East Indies and Australia, I have concluded to treat *Ochtheroidea* as generically distinct from *Athyroglossa* upon the following characters.

*Generic Diagnosis*.—Similar to *Athyroglossa*. Ocellar bristles behind or on line with the anterior ocellus, separated from each other as far as the posterior ocelli are from each other. Arista with long hairs above. Fore femora with distinct flexor spines (except in *melanderi*), of which the proximal one is sometimes slightly removed and much stouter than the others. Alula of wings linear with thickened ciliated margin.

*Genotype*.—*Ochthoidea atra* Williston, (1896). [Monotypic.]

The facial structure is very variable, from evenly and gently convex to distinctly subtuberculate. In some species the arrangement of the setulae, and the sculpturing of the mesonotum and scutellum, suggests a closer affinity with *Gymnopa* than do the others, but the facial characters offer no correlation. The development of the fore femoral spines is also variable, but in the material examined there is always some indication of such spines.

The sexes in many species are difficult to separate, and I have not attempted to do so. Some of the shining black species of *Discocerina* and its allies may be mistaken for species of this genus, but the development of the post-buccal ridge will at once distinguish those belonging here.

The genus is represented by eight species in the Americas, of which three occur north of Mexico.

#### *Table of American Species*

1. All tibiae black.
  - Halteres black.....(see ***Athyroglossa***)
  - Halteres white. (Neotropical)..... **centralis**
  - Only the fore tibiae black..... 2
2. Halteres black or dark..... **granulosa**
  - Halteres white or yellow..... 3
3. Wings yellowish, with apical infuscation; scutellum and abdomen flat; fore tarsi pale basally. (Neotropical)..... **atra**
  - Wings with discal and apical infuscation; scutellum and abdomen convex; fore tarsi black basally. (Neotropical)..... **fascipennis**
  - Wings immaculate..... 4
4. Mesonotum polished. (Neotropical)..... **laevis**
  - Mesonotum obscurely shining or granulose..... 5
5. Cheeks broad, about one-half height of eye.
  - Fore femora microscopically spinose; second costal section three times as long as third..... **melanderi**
  - Fore femora distinctly spinose; second costal section twice as long as third. (Neotropical)..... **similis**
  - Cheeks narrow, scarcely one-fourth eye height..... **glaphyropus**

**Oeththeroidea centralis** Cresson

1918. *Oeththeroidea centralis* Cresson, Trans. Am. Ent. Soc., XLIV, 60, pl. III, figs. 13, 14.

This species represents a group having the face sub-tuberculate, suggesting affinity with *Athyroglossa glabra*. It is readily distinguished by the white halteres and all tibiae being black.

*Description*.—♂, ♀. Black; apices of middle and hind tibiae and their tarsi, tawny. Two basal joints of fore tarsi, and halteres, white. Wings hyaline, with brown veins. Shining to polished, with mesonotum, scutellum, and abdomen, microscopically sculptured and faintly dusted with brown.

Frons broader than long; areas not differentiated. Face one-half as broad as vertex; median area tuberculose, or in profile subconically convex; sculpturing limited to a line of pits along the grooves. Clypeus projecting, mostly at a sharp angle with the face in profile. Cheeks one-half as broad as eye height. Antennae situated at center line of head, and below that of eyes; arista with four to five long hairs above.

Mesonotal setulae weak, rather scattered, or in close series. Scutellum strongly convex; marginal hairs and bristles long. Abdomen flattened, with lateral margins sharp; second to fourth segments broad, subequal in length, or fourth the longest; fifth short. Legs stout; fore femora with short, subequal flexor spines and a longer proximal one. Third costal section hardly one-half as long as the second. Length.—2.5 mm.

*Type*.—♂; Turrucares, Costa Rica, December 20, 1909, (P. P. Calvert), [A. N. S. P. No. 6136].

*Material Examined*.—20 specimens.

MEXICO: Tampico, Tamaulipas, December 5, (F. C. Bishopp), [U. S. N. M.].

CUBA: Cerro Cabras near Pinar del Rio, September 11, (F. E. Lutz); Guane, September 24–26, (F. E. Lutz), [A. M. N. H.]. Guantanamo, February 10, (H. Skinner).

PORTO RICO: Mayaguez, February 16, (F. E. Lutz; along stream); San Juan, near San Juan, February 12, (F. E. Lutz); [all N. Y. Ae. Sc.].

COSTA RICA: Alajuela, September 15; Bonnefil Farm, Rio Surubres, October 20; Philadelphia, January 18; Turrucares, December 20; (all P. P. Calvert).

COLOMBIA: Aracataca, February, (Ujhelyi), [Hung. N. M.].

BRITISH GUIANA: Bartica, February 5, (R<sub>4</sub> J. Crew).

**Oeththeroidea fascipennis** Cresson (Plate XX, figure 10.)

1918. *Oeththeroidea fascipennis* Cresson, Tr. Am. Ent. Soc., XLIV, 60.

This species may be placed next to *centralis*, but apparently is not closely related. It is readily distinguished by the infuscation of the wings. It is more slender than *centralis*, but the profile of the face is similar. The abdomen is elongate, not flattened, with the lateral margins turned under, not sharp, so that the venter is deeply sunken in dry specimens.

*Description*.—♂, ♀. Shining black; middle tarsi, hind tibiae and tarsi, yellow; halteres and fore tarsi, except bases, white; third antennal joint brown; wings with a large discal and a broad apical infuscation (fig. 10). Entirely polished, but mesonotum, scutellum, and abdomen above, obscured by close granulation, although the abdomen is less so.

Structurally similar to *centralis* with exceptions. Frons quadrate, surface somewhat relieved on the triangle. Face more spherically convex, without any median tuberculous swelling. Scutellum more triangular with apical bristles weakly tuberculate. Abdomen elongate; lateral margins revolute and the ventral lobes not appressed to venter, leaving the venter broadly sunken. Fore femora with flexor series of distinct spines which regularly diminish in length distally. Length.—2 mm.

*Type*.—♂; Aracataca, Department of Magdalena, Colombia, February 1912, (Ujhelyi), [Hung. Nat. Mus.].

Three topotypes, and additional specimens from Alajuela, Panama, March 12, (A. Busek), [U. S. N. M.], have been examined.

**Ochtheroidea atra** Williston (Plate XX, figures 3, 11, and 12.)

1896. *Ochtheroidea atra* Williston, Trans. Ent. Soc. London, 1896, 101, pl. xiii, figs. 146, 146a.

This is the most robust species in the genus. It may be considered typical of a group, including *similis*, in which the facial sculpturing is in the form of transverse grooves, while the pits along the parafacial groove appear as a longitudinal, subopaque line. It may readily be distinguished from *similis* by the frons and face being more deeply sculptured, not smooth; the mesonotum and scutellum opaque, the latter broad with the apical margin truncate. This is another species that suggests affinity with *Gymnopa* in many respects.

The specimens in the material studied agree in every respect with the paratypes in the American Museum of Natural History. The original description states that there were twelve males in the typical series. This may be an error, easily made in this group unless one is very careful in the determination of sex.

*Description*.—♂, ♀. Black; middle and hind tibiae and their tarsi, except apically, yellowish or whitish; halteres and two basal joints of fore tarsi, white; wings yellow, with a more intense cloud at apex (fig. 11). All bristles and hairs small and minute.

Eyes noticeably obliquely oval. Frons nearly as broad as long, shining and sculptured with rugae and pits on the triangle; bristles weak, the frontal and orbital not discernible. Face, in profile, moderately sub-conically gibbose.



below medianly (fig. 3); facialia with transverse pits and rugae along the grove which extend mesally toward the transversely wrinkled median gibbosity, the wrinkling extending up to and on the weak carina; bristles short, hair-like. Cheeks one-half as broad as eye-height. Antennae short, situated at the center line of the eyes and above that of the head; arista with about three hairs above.

Mesonotum convex, opaque, densely granulose and somewhat pollinose. Scutellum sculpture as on mesonotum, flat, rectangularly broader than long, with all the marginal hairs and bristles on minute tubercles. Abdomen flat, elongate-ovate, subopaque, with sharp lateral margins, with sculpturing as on mesonotum but less pronounced; fourth segment the longest; fifth the shortest. Legs slender; femoral spines with the proximal one abruptly the longest, and the remaining ones more uniform (fig. 12). Third costal section of wings three times as long as second. Length.—2.5 to 2.75 mm.

*Type*.—Male ?; St. Vincent, West Indies, [British Museum?].

*Paratypes*.—A male in the American Museum of Natural History collection, No. 20324, bears no data except Dr. Williston's determination label; a female in the same collection is also labelled "Leeward near sea by open stream, Sept., no. 20322." There is also a specimen in the Kansas University collection.

*Material Examined*.—16 specimens.

PANAMA: Colon, December, 1911, (Ujhelyi), [Hung. Nat. Mus.].

TRINIDAD: June, 21, (A. Busck), [U. S. N. M.].

BRITISH GUIANA: Bartica, May 11, (R. J. Crew). Georgetown, July 11, [A. N. M. H.]. Tumatumari, July 11, [A. M. N. H.].

***Ochtheroidea similis* Cresson** (Plate XX, figure 7.)

1918. *Ochtheroidea similis* Cresson, Trans. Am. Ent. Soc., XLIV, 61.

A very distinct species showing affinity with *atra*, but with some aspects of *laevis*. The face is very strongly convex, rather abruptly so, giving a gibbose appearance; facialia distinctly, transversely wrinkled, with the hair-like bristles arising from grooves instead of pits, as in *laevis*. These as well as the broad face and cheeks are the salient characters.

*Description*.—♂. Black; middle and hind tibiae and their tarsi, except apices of latter, yellow; fore tarsi with three basal joints whitish; halteres white; wings hyaline, with dark veins. Shining to nearly polished.

Frons broader than long. Face broad, more than one-half as broad as vertex, deeply depressed above and evenly convex below medianly; facialia with deep, transverse pits; bristles hair-like; median area micro-granulose, hardly polished. Cheeks about one-half as broad as eye-height. Clypeus retreating. Arista with seven hairs.

Mesonotum and scutellum not quite polished, micro-granulose; setulae of former minute, scarcely discernible, not seriated. Abdomen polished;

fourth segment nearly twice as long as third. Legs rather stout; fore tibiae noticeably flattened; anterior extensor surface of middle and hind tibiae silvery; femoral spines strong and numerous; the proximal one separated, very stout and more obliquely inclined than the others (fig. 7). Second costal section of wings twice as long as third. Length.—2.5 mm.

*Type*.—♂; Cachi, Costa Rica, March 7, 1910, (P. P. Calvert; beaches on back channel of Rio Reventazon), [A. N. S. P., No. 6134].

*Paratype*.—1 ♂; topotypical.

**Ochtheroidea melanderi** new species (Plate XX, figures 6, 9.)

This species, although suggesting *similis* in many respects, is evidently very distinct, and will be readily recognized by the characters given below.

Resembling *similis*, but less shining. Facial pits shallow and not transverse (fig. 9). Apical bristles of scutellum hardly longer than the setulae or marginal hairs. Fore femora with only minute flexor spines (fig. 6) in the male, which are hardly discernible in the female. Second vein long, so that the second costal section is at least three times as long as third.

*Type*.—♂; Stanford University, California, July 15, (A. L. Melander), [University of Washington Collection].

*Paratypes*.—4 ♂, 3 ♀; topotypical.

**Ochtheroidea laevis** Cresson

1918. *Ochtheroidea laevis* Cresson, Trans. Am. Ent. Soc., XLIV, 61.

This species is readily distinguished by its highly polished surfaces. The face is more strongly convex than in *glaphyropus*, and the sparse mesonotal setulae are arranged in well separated rows.

*Description*.—Polished black; middle and hind tibiae and their tarsi, except apices, yellow; three basal joints of fore tarsi and halteres, white; wings hyaline with dark veins. Middle tibiae sometimes infuscated medially.

Similar to *glaphyropus*, but larger. Frons somewhat broader than long, with bristles well developed. Face narrowed above middle to one half as wide as vertex. Cheeks narrow, about one-fifth as broad as eye-height. Arista with six to seven hairs.

Mesonotal setulae sparse and distinctly seriated. Apical bristles of scutellum with minute tubercles at bases. Third and fourth abdominal segments subequal. Legs as in *similis*; femoral spines few, about five, the proximal one much the largest, stout, and distally removed. Length—2.5 to 3 mm.

*Type*.—♂ ?; Alajuela, Costa Rica, September 15, 1909, (P. P. Calvert; sweeping), [A. N. S. P., No. 6135].

*Material Examined*.—27 specimens.

COSTA RICA: Alajuela, September 15, (P. P. Calvert).

CUBA: Guantanamo, February 10, (H. Skinner).

PORTO RICO: Adjuntas, June 10, (F. E. Lutz and A. J. Mutchler; at light); Arecibo, March 1-4, (F. E. Lutz); Barros, June 4, (F. E. Lutz and A. J. Mutchler; in open field); Mayaguez, February 16, (F. E. Lutz; along stream); Foothills of Mt. Duque, Naguabo, March 9, (F. E. Lutz); Side of El Yunque, near Rio Grande, July 3, (F. E. Lutz; forest); [all N. Y. Ae. Sc.].

The material from Cuba and Porto Rico shows considerable white or yellow on the apices of the fore tibiae, but otherwise there seems to be no difference.

**Ochtheroidea glaphyropus** Loew (Plate XX, figure 8.)

1878. *Athyroglossa glaphyropus* Loew, Zeits. f. Ges. Naturwiss., Berlin, LI, 197.

In this species the face is evenly convex, hardly visible, in profile, beyond the orbits, and making a continuous line with the generally compressed clypeus. The surface of the mesonotum and scutellum is minutely granulose, giving them a dull, greasy appearance, but they are not pruinose; the setulae are numerous and minute. The specimens from Central and South America seem to be identical with those from the north.

*Description*.—Black; halteres and fore tarsi white, with apical joints of latter sometimes darker; middle and hind tibiae, and tarsi, except apical joints, tawny. Wings hyaline with dark veins. Polished except the mesonotum and scutellum, which are somewhat obscured by the minutely granulated surfaces. Anterior surface of middle tibiae silvery.

Eyes vertically elongate. Frons quadrate or orbits converging; proclinate orbitals minute. Face narrowed to about one-third width of vertex, depressed above, with lower median area, in profile, evenly and gently convex and retreating (fig. 8); bristles hair-like, arising from minute pits along the groove. Cheeks narrow, at most one-fourth as broad as eye-height. Antennae situated above center line of eyes and of the head; third joint oval; arista with six to seven hairs above.

Mesonotal setulae numerous, in very close series. Scutellum convex or flattened, triangular; bristles not tuberculate at bases. Abdomen broad, ovate; segment three and four subequal; lateral margins revolute. Femoral spines weak, subequal. Second costal section three to four times as long as third. Length.—2 to 2.5 mm.

*Type*.—♂ ?; Texas, [M. C. Z., No. 11145.]. This specimen has been examined and is in good condition. It bears a "Texas" and another small square orange label, and was selected as the type. Another specimen from the same locality was treated as a paratype, but has the apices of the fore tarsi white.

*Material Examined*.—41 specimens.

NEW YORK: Cold Spring Harbor, Long Island, August, [Wash.].

PENNSYLVANIA: Lansdale, July 12; Swarthmore, July 4-31; [all Cresson].

DISTRICT OF COLUMBIA: Washington, August 13, [Wash.].

MARYLAND: Bladensburg, September, 23, (R. C. Shannon); Plummer's Island, July 24, (Shannon; at light); [all U. S. N. M.].

VIRGINIA: Rosslyn, July 6, (F. Knab), [U. S. N. M.].

GEORGIA: Billy's Island, Okefenokee Swamp, June 15 to July; Spring Creek, Decatur County, June 7, (J. C. Bradley); [all Cornell].

SOUTH CAROLINA: Summerville, August 22, (J. C. Bradley), [Cornell].

ALABAMA: (C. F. Baker no. 2245), [Aldrich].

LOUISIANA: Opelousas, May, [Wash.]. Tallulah, August 10, (H. Perkins), [U. S. N. M.].

TEXAS: Devil's River, May 5, (F. C. Bishopp), [U. S. N. M.].

COSTA RICA: Bonnefil Farm, Rio Surubres, October 20; Turrucares, December 19; [all P. P. Calvert].

BOLIVIA: Piedra Blanca, April, [Wash.].

### ***Ochtheroidea granulosa* new species**

This is the only known American species having black halteres, so there will be no difficulty in distinguishing specimens belonging here. In general it resembles *glaphyropus*, and probably will be found in some collections under that name. There seem to be no apparent differentiations in the South American and West Indian specimens.

*Description*.—Similar to *glaphyropus*, but the face medianly, from antennae to epistoma, minutely granulose; the pits along the groove are transverse. Mesonotum and scutellum distinctly granulose. Halteres black. Arista with five to six long hairs. Femoral spines scarcely discernible.

*Type*.—♂; Swarthmore, Pennsylvania, July 31, 1910, (Cresson; along shady creek), [A. N. S. P., No. 6345].

*Material Examined*.—18 specimens.

MASSACHUSETTS: New Bedford, [Wash.].

NEW YORK: Norton's Landing on Cayuga Lake, June 5, (H. H. Smith), [Cornell].

PENNSYLVANIA: Swarthmore, July 31 to October 19, (Cresson). Point Pleasant, May 30, (H. S. Harbeck).

DISTRICT OF COLUMBIA: Washington, August 17, [Wash.].

MARYLAND: Bladensburg, September 28, (R. C. Shannon); Cabin John Bridge, April 28, (Knab & Malloch); Plummer's Island, April 8 to July 11, (R. C. Shannon); near Plummer's Island, May 11 to August 5, (R. C. Shannon); [all U. S. N. M.].

VIRGINIA: Dead Run, Fairfax County, April 7 to September 27, (R. C. Shannon), [U. S. N. M.].

INDIANA: Lafayette, July 4, [Wash.].

GRENADA: [Aldrich].